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Some Recent Books on Bacteriology.—One of the most recent works dealing with the bacteria is Dr. Sternberg's[1] Manual of Bacteriology. He is well known as an investigator in this field, and is moreover one of the pioneers in the United States. The work is a most comprehensive one, the best published in the English language. While perhaps not so full on pathogenic organisms as Baumgarten's Lehrbuch der Pathologischen Mycologie, yet it is sufficiently full and complete to make it one of the best books of its kind. It moreover contains accounts of the most recent discoveries in regard to pathogenic organisms.

One hundred and one pages are devoted to history, classification, morphology and general bacteriological technology. The author adopts the classification of Baumgarten (1890) with slight modifications. He divides the species into (1) relatively monomorphous and (2) pleomorphous. Under the first micrococci, bacilli, and spirilla are grouped; under the second spirulina of Hueppe, leptotricheæ (Zopf) and cladotricheæ. Hauser's Proteus also belongs here. Part second is devoted to general biological characters; including an account of the action of antiseptics and germicides. Dr. Sternberg's work on antiseptics and germicides is so well known that it will not be necessary to refer to this part of the work at length. Three hundred pages are devoted to pathogenic bacteria, 158 species are carefully described, and many are illustrated. In some cases the colors of the growth when grown in different nutrient media are given. Botanists will be chiefly interested in the account given of the saprophytic bacteria. Chapters are devoted to the bacteria of the air and water, bacteria found in the stomach and intestinal canal, articles of food and soil, in which the usual methods of culture are given. Three hundred and thirty one species are described. This feature of the book makes it especially commendable. Those who have had occasion to use the classification of De Toni in Saccardo's Sylloge Fungorum or that of Crookshank in his Manual of Bacteriology have found the descriptions of the species far from satisfactory. The descriptions given by Sternberg are ample for the determination of the species.

The biological characters are very full. An excellent bacteriological diagnosis is a great aid in the determination of the species. A few errors have made their way into this part of the book. On page 758, *Bacillus citreus-cadaveris* is said to be motile, but turning to page

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[1] A Manual of Bacteriology. Illustrated by heliotype and chromolithographic plates and two hundred and sixty-eight engravings, 886 pp. New York, Wm. Wood and Co., 1892.

633 where the species are described it is said to be non-motile. The same for *Bacillus fulvus*, which p. 758, is said to be motile, but on p. 629 is described as non-motile. Notwithstanding that a few of these defects occur, this part will certainly be appreciated by working bacteriologists. In this key the following characters are used. (1) Morphologic; Micrococci, Bacilli, Spirilla, Leptotricheæ and Cladotricheæ. Formation of spores, independent motion. (2) Physiological characters; relation to oxygen, ærobic, strictly anærobic, facultative anærobic, growth in gelatin, liquefy or do not, no growth in gelatin, growth on potato, in milk, coagulate milk, do not coagulate milk, color of growth, chromogenes, not chromogenic, pathogenesis.

The bibliography has been gotten together with great care, and is very full, containing the titles of 2,582 papers grouped under historical classification, staining methods, culture media, sterilization of culture media, etc. A very large number of papers are cited on the physiological properties, such as lactic acid fermentation, viscous fermentation, putrefaction, etc. The literature on pathogenic microorganisms is especially full. Bacteriologists should feel grateful to Dr. Sternberg for this work, and also to the publishers for the excellent manner in which their part also has been performed.

Wm. Wood & Co. have during the past four years issued two other text books on bacteriology; the English translation of Salomonsen's Bacteriological Technology, by Professor Trelease is well known and needs no introduction. A second admirable work, antedating Sternberg's Manual, is Fränkel's Grundriss der Bakterienkunde translated by J. H. Linsley.[2] It has been translated into six different languages, and those who have been fortunate enough to use the German edition know its admirable qualities. The translation before us is an admirable one. The style is clear and there is no difficulty in understanding the author. The work contains a great deal on the biology of many species that hitherto has not been found its way into English works. It is to be regretted however that references to literature are not given, but these may readily be obtained from Sternberg's Manual. No figures are given in the book, but the accounts are clear. Future editions should have figures.

For a limited amount of work both of the books noticed above are too large. One of the best of the small books with which the writer is familiar is Abbott's[3] Principles of Bacteriology.

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[2] Text-book of Bacteriology, third edition, translated and edited by J. H. Linsley, pp. 376. New York, Wm. Wood & Co., 1891.

[3] The Principles of Bacteriology. A manual for students and physicians. Lea Brothers & Co., Philadelphia, 1892, pp. 263

This book is well suited for class room work. Its technique is stated in clear and concise language, accompanied with numerous illustrations. The writer having used this for a large class is prepared to say that it is an excellent work of its kind.

Another hand-book intended for a larger circle of readers is Woodhead's[4] small volume on Bacteria and their Products. It treats the subject in a somewhat different manner than the others. It gives considerable attention to historical matters, and treats quite fully the different systems of classification used by Ehrenberg, Cohn, Van Tiegham, Zopf, De Bary, Hueppe and Flügge. The chapter on fermentations contains a great deal on chemistry, but it is far from being a popular exposition of the question. The author has of course largely drawn from Hansen, Pasteur, and Schützenberger. The author uses the word parasite and saprophyte in a somewhat peculiar way. He speaks of the bacteria of the mouth as being parasites, contradicting a previous statement made with reference to parasitic bacteria. The work has been edited rather carelessly, the word "parasiticism" for parasitism occurs in several places as well as the word "saprophyticism."—L. H. PAMMEL.

Report on the Fish and Fisheries of the United States for 1888.[5]—This volume, an octavo of 902 pages, contains in addition to the Reports of the Commissioner, Hon. Marshall McDonald and his two assistants, 11 important papers bearing upon the Fish Industry. The results of the sea-coast inquiries conducted during the year 1888 are embodied in the reports of Mr. J. W. Collins and Lieutenant Commander S. L. Tanner. The work accomplished at the laboratory of Woods Holl, Massachusetts is reported on by Mr. J. A. Ryder. Notes on Entozoa of Marine Fishes, with descriptions of new species and the anatomy of *Thysanocephalum crispum* Linton are given by Mr. E. Linton.

Number 8 in the series of Appendices is a review of the Fresh-water Sunfishes of North America by Mr. C. H. Bollman. It is the beginning of the systematic investigation of interior waters by volunteer naturalists under the direction of Dr. D. S. Jordan. The Apodal Fishes inhabiting the waters of America and Europe are reviewed by

[4] Bacteria and their Products. The contemporary Science series, edited by Havelock Ellis, pp. 459, with 20 photo-micographs. London, Walter Scott, 24 Warwick Lane, Charles Scribner Sons, New York, 1892.

[5] U. S. Commission of Fish and Fisheries. Part XVI. Report of the commissioner for 1888. Washington, 1892.